INFRASTRUCTURE ELEMENT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FIGURE PAGE NO.

I. INTRODUCTION

The purpose of the Infrastructure Element is to identify sanitary sewer, potable water, drainage and solid waste system improvements needed to accommodate future development of the City. Protection of natural groundwater recharge areas is also addressed.

TABLE I - POPULATION PROJECTIONS

YEAR	TOTAL PROJECTED POPULATION	HOUSEHOLD SIZE	HOUSEHOLDS
1960	373	3.5	125
1970	518	3.1	167
1980	683	2.6	262
1989	859 (from housing survey)	2.49	345
1990	889	2.48	358
1995	1054	2.42	436
2000	1235	2.43	508
2005	1490	2.42	615
2010	1744	2.42	721
2020	2463	2.41	1022

Population projections are based upon linear mathematical extrapolation technique. These projections are based on the 2000 Census, and the "Bureau of economic and Business Research (BEBR) Florida Population Studies, Population Projections by Age, Sex and race for Florida and its Counties, 2002-2025." Census data figures were compared to current population projections based upon the number of currently occupied households of 511 multiplied by the projected number of persons based upon reduction of 2000 census calculation of 2.43 persons per household by the average rate of decline in household size in Walton County as a whole of .45% per year. The result of 1235 persons living in Freeport in 2000 compared with the 518 living in Freeport in 1970 yields a linear growth rate over the 30 year period of 4.1% per year.

II. SANITARY SEWER SUB-ELEMENT

A. Regulatory Framework

Federal: The Federal Water Control Act (PL 92-500) controls provision of sewer services on the national level. The provisions of this Act address the restoration and/or maintenance of the chemical, physical and biological integrity of waters in the nation. Under this Act, national policy for implementing area-wide waste treatment and management programs to ensure adequate control of pollutants were established. Grants to construct facilities to treat point sources of pollution, including effluent from sewage treatment plants, are made available to local governments under Section 201 of PL 92-500. Implementation of this Act is the responsibility of the U.S. Environmental Protection Agency.

State: The Florida Department of Environmental Protection (DEP) is responsible for ensuring that the provisions of PL-500 are carried out at the State level. Under Chapter 17-6, F.A.C., DEP has adopted rules for regulation of wastewater facilities which treat flows meeting established regulatory criteria.

The Florida Department of Health regulates the installation of septic tanks and drainfields within the State. The requirements for installation were adopted by rule of Chapter 1OD-6 F.A.C. These Rules are administered locally by the County Health Department.

B. Data Summary and Analysis

In April 1987, a Wastewater Management Facility Plan was prepared for the City and the surrounding unincorporated area. Figure 1 depicts the area involved in the study. Figure 2 depicts the Freeport Utility Service Area. At the time, all wastewater was disposed of by individual septic tanks and absorption fields. Figure 3 shows the soils associated with the area while Table 2 presents the limitations associated with sanitary facilities for these soil types. The City embarked upon the study because there was a concentration of 40% of all septic tanks in a 1.5 square mile area with a high groundwater table and a history of drainage problems. Local health department officials estimated that at least 80% of these septic tank systems either had malfunctioned or had an extremely high potential for doing so. The City had determined that it must act to provide for a central sanitary sewer system.

Figure 1, The Water Management Facility Plan Study Area Map is a wall size map available in City Hall.

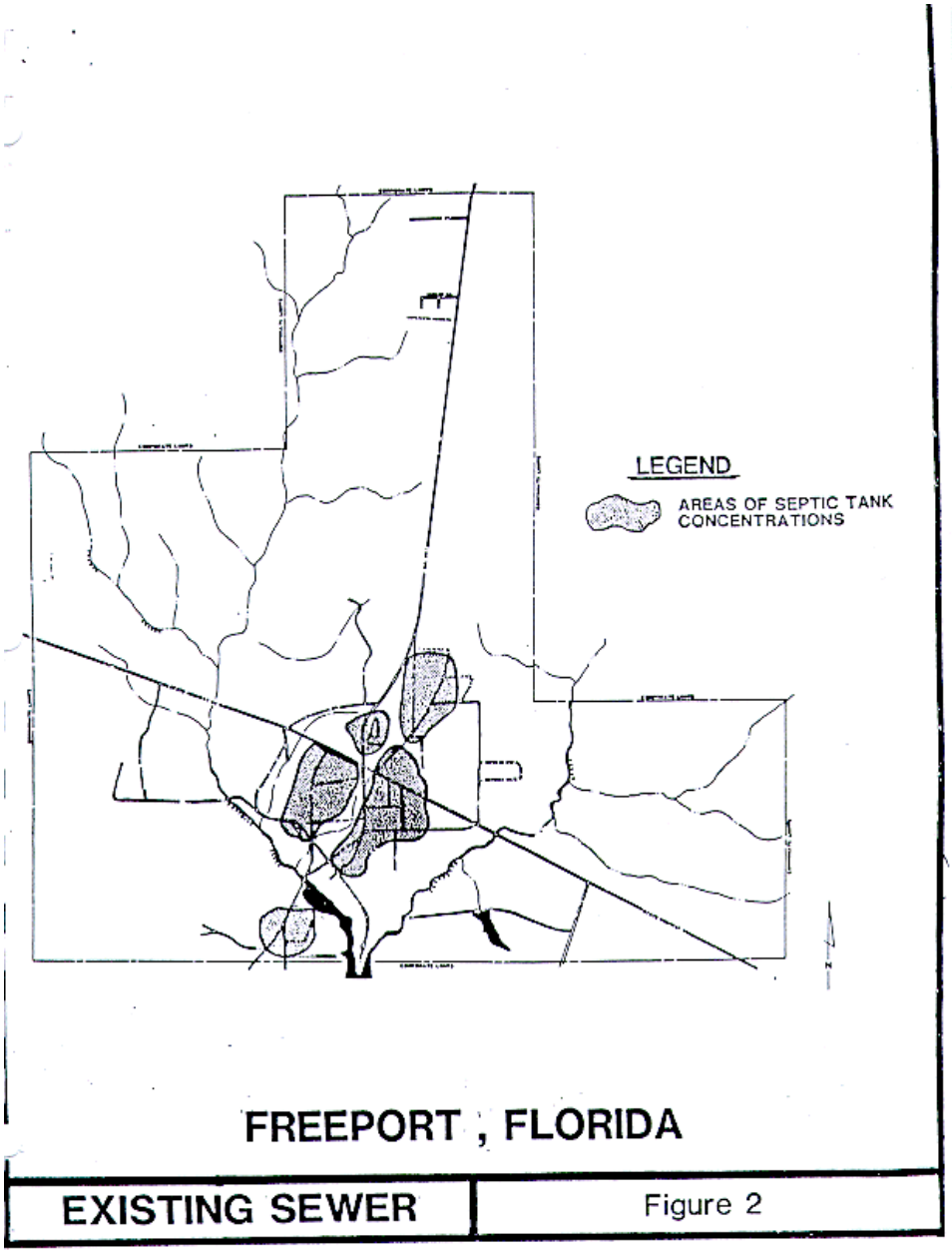

Figure 2
Freeport Utility Service Area

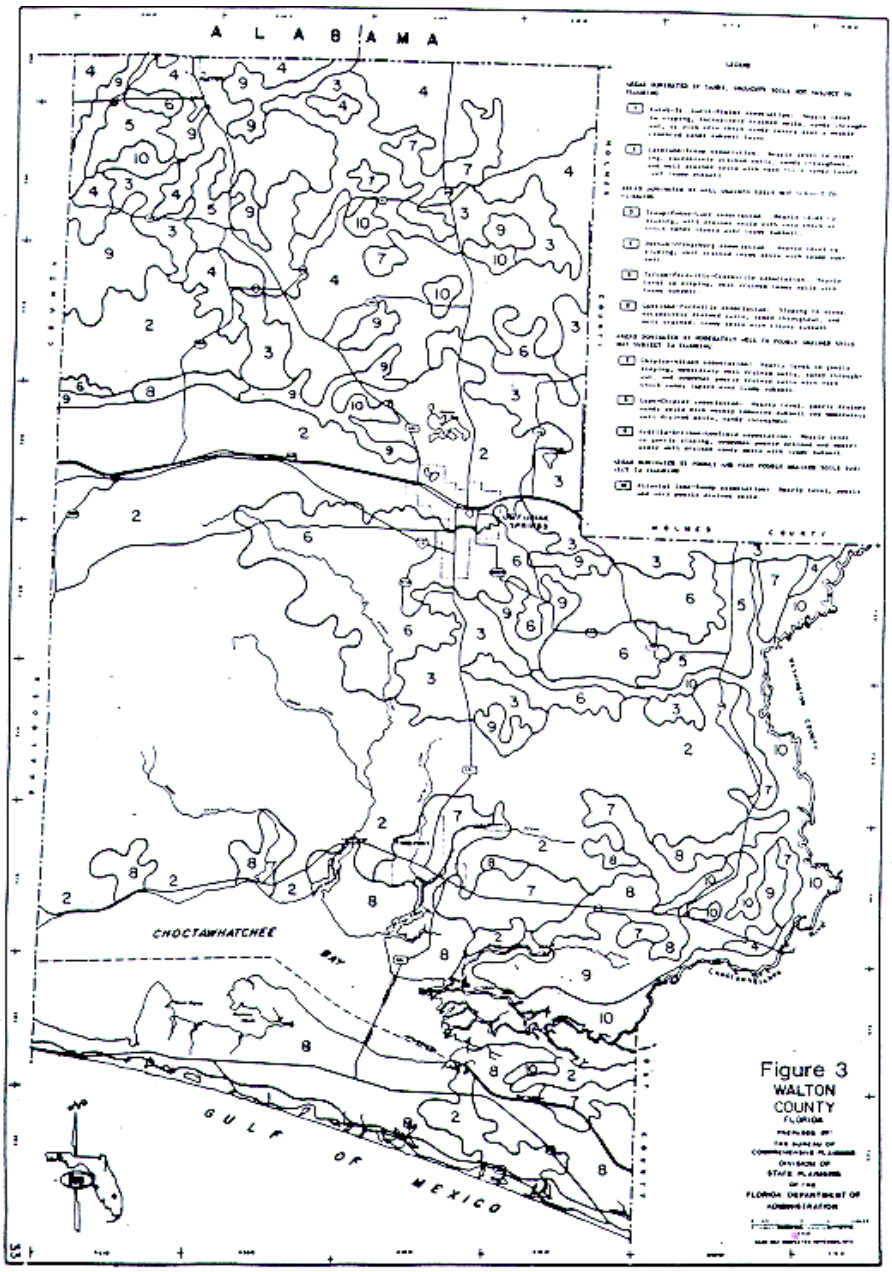

Figure 3
Soil Associations

TABLE 2
SOIL TYPES AND LIMITATIONS FOR SANITARY FACILITIES

Soil Type	Soil Series	Septic Tank Absorption Fields	Sewage Lagoon Areas	Sanitary Landfill (Trench)	Sanitary Landfill (Area)	Daily Cover for Landfill
1	Albany-Pactolus	Severe; Wetness	Severe; Seepage; Flooding	Severe; Wetness; Seepage	Severe; Wetness;	Poor; Wetness
2	Bonifay Loamy Sand 0-5% Slope		Severe; Poor Filter	Severe; Seep Too Sandy	Moderate; Seep	Severe; Fair; Too Sandy
4	Chipley Sand	Severe; Wetness; Poor Filter	Severe; Seepage Wetness	Severe; Seepage; Wetness; Too Sandy	Severe; Seepage; Wetness	Poor; Too Sandy Seepage
8	Dorovan-Pamlico	Severe; Flood, Poor Filter	Severe; Seep, Flood	Severe; Flood, Seep	Severe; Flood, Seep	Poor; Seep, Wet, Excess Humus
12	Foxworth Sand	Severe; Wet, Poor Filter	Severe; Seepage	Severe; Seepage; Too Sandy; Wet	Severe; Seepage	Poor; Seepae, Too Sandy
13	Fuquay Loamy Sand 0-5% Slope	Percs Slow	Moderate;	Moderate; Slope	Slight	Slight Fair; Too Sandy
15	Kinston-Johnston-Bibb	Severe; Flood, Wet Wet	Severe; Flood, Flood, Wet	Severe; Flood, Wet	Severe;	Poor; Wet

TABLE 2
SOIL TYPES AND LIMITATIONS FOR SANITARY FACILITIES
(Continued)

Soil Type	Soil Series	Septic Tank Absorption Fields	Sewage Lagoon Areas	Sanitary Landfill (Trench)	Sanitary Landfill (Area)	Daily Cover for Landfill
17	Lakeland Sand 0-5% Slope	Slight	Severe; Seepage;	Severe; Seepage;	Severe; Seepage Too Sandy	Poor; Seep Too Sandy
18	Lakeland Sand 5-12% Slope	Slight	Severe; Seepage; Slope	Severe; Too Sandy	Severe; Seepage	Poor; Seep, Too Sandy, Wet
27	Rutlege Fine Sand	Severe; Flood; Wet; Poor Filter	Severe; Seepage; Flood; Wetness	Severe; Flood; Wet; Seepage	Severe; Flooding; Wetness; Seepage	Poor; Seep Too Sandy; Wetness
31	Troup Sand	Slight	Severe; Seepag e	Severe; Too Sandy	Severe; Seepage	Poor; Too Sandy
36	Pits	Not Rated				
42	Blanton Sand	Moderate; Wetness	Severe; Seepage	Severe; Too Sandy	Severe; Seepage	Poor; Too Sandy, Seep
57	Hurrican Sand	Severe; Wetness; Poor Filter	Severe; Seepage; Wetness	Severe; Wet Seepage; Too Sandy	Severe; Seepage; Wetness	Poor; Seep Too Sandy

The intitial sewer system was placed into oeration in January 1991 with a customer load of 290. It consisted of a 150,000 gallon per day treatement plant and 13,500 linear feet of six-inch force main. Additional collection lines were installed in 1992, bringing the connected customer load to 410. Subsequent "scatter lot" additions along existing lines continued unitl 1997, bringing the connected load at that time to approximately 500 customers. In year 2000, the treatment plant capacity was doubled to 300,000 gallons per day. Currently, the connected customer load is 540 and growing. The City is in the process of expanding the treatment plant to 600,000 gallons per day. The expansion is scheduled to be completed in 2005. Funding for the sewer treatment plant has come from multiple sources including the USDA Rural Development, CDGB, EPA and local sources. The plant has the capacity to be expanded to 2 million gallons per day.

The LOS was determined by analyzing the average daily sales and the average daily plant flows as depicted in Table 3. One residential customer is considered one household.

TABLE 3
SANITARY SEWER SALES 2003

MONTH	COMMERCIAL		SCHOOLS		RESIDENTIAL		TOTAL	DAYS	AVG. DAILY SALES	PLANT FLOW
	#CUST	GALLONS	#CUST	GALLONS	#CUST	GALLONS	GALLONS			
OCT	90	705,860	3	461,110	449	2,044,150	3,211,120	31	103,684	122,000
NOV	90	837,640	3	375,780	450	2,145,300	3,358,720	30	111,957	120,000
DEC	89	773,580	3	296,550	449	1,929,880	3,000,010	31	96,774	116,000
AVG	89	772,360	3	377,813	449	2,039,777	3,189,950	31	104,909	119,333

Source: City of Freeport

Average residential customers= 449 X 2.43 = 1091 population served.
2,039,777 residentail gallons per mo./31 = 65,799 gallons per day.
65,799 gallons per day/1091 = 60 gallons per person average.
Peak is generally 150% of average, peak flow = 90 gallons per person.
1,000 square feet of commercial is = 1 ERU

TABLE 4
PROJECTED SANITARY SEWER DEMAND - MGD

Year	Population	Avg. LOS 60gpd(mgd)	Peak LOS 90 gpd (mgd)	Current Available Capacity (0.12mgd) less Peak demand	Upgraded Available Capacity (0.42 mgd) less peak.demand (on-line 05/06)
2005	1181	0.07	0.10	0.02	
2010	1404	0.08	0.13		0.29
2020	1982	0.12	0.18		0.24

Available capacity is total capacity less schools, commercial, and committed.
Population is based on residential customers in sanitary sewer service area.
Source: City of Freeport

The sanitary sewer system has sufficient capacity for the planning period.

C. Limitations on Development

There were significant development limitations upon the entire City of Freeport before construction of its Sewage Treatment Plant. These limitations were based upon HRS limitations of 4 dwelling units per acre in areas where there is no public sewer system, and those limitations will remain in effect in areas in which the sewer system does not yet extend. However, the majority of areas in which any significant development is anticipated is able to support significantly higher development densities due to the availability of the sewer system.

III. SOLID WASTE SUB-ELEMENT

A. Regulatory Framework

Federal/State: The potential environmental impacts of solid waste facility have led to the development of an extensive network of permitting requirements at the federal and state levels. Impacts on air and water quality are reviewed by the U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP), and where dredging and filling might occur by the U.S. Army Corps of Engineers (COE). The Regional Water Management District also provides state level review for water quality and quantity impacts. Actual construction and operation of solid waste facilities requires further permits and review by FDEP. For processing plants which will generate electrical power or require tall emission sacks, further DEP and Federal Aviation Administration (FAA) review may be required.

B. Data Summary and Analysis

The City of Freeport contracts with a solid waste collection service for garbage pickup. Solid wastes are disposed of at the Walton County Central Sanitary Landfill. Figure 4 indicates the location of the Landfill site. Walton County is responsible for maintaining the Landfill site, while it is left up to the City of Freeport to transport the trash twenty miles to the site. Trash from City and County residents in the southwestern portion of the County north of Choctawhatchee Bay is taken to the Freeport pickup box.

The City of Freeport presently generates approximately 3.7 tons of solid waste per day. This estimate 'is based on the state average generation rate of six pounds per capita per day and City 2000 population of 1235. This is approximately three percent of the total daily solid waste generated within the County (based on County 2000 population of 40,601 and generation of six pounds per capita per day). Assuming the same generation rate through the planning period, the City will generate approximately 4.47, 5.23 and 7.39 tons per day in the years 2005, 2010 and 2020, respectively.

C. Hazardous Waste

In 1985, the West Florida Regional Planning Council conducted a regional hazardous waste assessment pursuant to the requirements of Chapter 403.7, Florida Statutes. The state law requires a listing of the small quantity generators throughout the County and a nomination of two potential disposal sites. The possible disposal sites were approved by the Board of County Commissioners in July 1985. The WFRPC evaluated the nominated sites, along with others throughout the West Florida Region, and designated sites in Escambia, Santa Rosa and Bay counties as the transfer treatment facilities for the West Florida Region.

Figure 4
Landfill Locations

IV.

DRAINAGE SUB-ELEMENT

A. Data Summary and Analysis

There are two major tributaries which flow southward through Freeport. One is Four Mile Creek, which drains all land west of US Highway 331 (SR 83). The other tributary is Lafayette Creek, which flows through the eastern portion of the City. The only structures are the bridges located on SR 20 which passes over the creeks individually. The Florida Department of Transportation retains operational responsibility of the bridges.

The City has a high water table, that may cause drainage problems. Figure 5 depicts the natural drainage pattern. The City will develop an inventory of drainage structures and identify a program of improvements. The City has adopted land development regulations that control development in floodprone areas. The existing stormwater management system provides sufficient protection for the near future.

Figure 5
Major Drainage Basins

V. POTABLE WATER SUB-ELEMENT

A. Regulatory Framework

Federal - The Federal Government regulates drinking water systems through the Safe Drinking Water Act, Public Law 93-523. Under this law, the Environmental Protection Agency (EPA) established minimum drinking water standards. These standards are divided into two categories; "primary," which is the standard required for public health and "secondary," which is recommended for aesthetic quality.

State - The Florida Department of Environmental Protection (DEP) is responsible for regulation of water systems on the State level. In accordance with the Florida Safe Water Drinking Act, Sections 403.850-403-864, Florida Statutes, DEP has promulgated rules classifying and regulating public water systems under Chapter 17-22, F.A.C. Primary and secondary federal standards are mandatory in Florida.

The Northwest Florida Water Management District (NWFWMD) is responsible for managing water quantity within its boundaries (which includes Walton County). The Water Management District (WMD), through consumptive use permitting, allocates water resources to permitted consumers.

B. Data Summary and Analysis

For purposes of this analysis, existing system capabilities and demands for both the City of Freeport main system and the newly constructed Portland Water System, which is wholly owned and operated by the City of Freeport, will be considered as one fully integrated system. As shown in Table *5*, the combined system maximum pumping capacity is 6.77 MGD while the combined Consumptive Use Permit allowance withdrawal amounts, shown in Table 6, are: 2.40 MGD (ADR); 2.81 MGD (MDR); and 82.11 MG (MMR).

TABLE 5
WELL PUMPING SUMMARY
(Design Capacity)

	Pumping Rate	Max. Daily Capacity
Well F-2	1500 GPM	0.370 MGD*
Well F-3	1070 GPM	1.540 MGD
Well F-4	425 GPM	0.612 MGD
Well F-5	1750 GPM	2.520 MGD
Well P-1	1200 GPM	1.728 MGD
TOTAL	5945 GPM	6.77 MGD

*Pumping Limited By CUP.
Source: City of Freeport

TABLE 6
CUP PERMITTED WITHDRAWALS

	Portland	Freeport	Regional	Total
Average Day	0.0658	0.63	1.70	2.3958, (2.40 rounded)
Maximum Day	0.0987	1.01	1.70	2.8087, (2.81 rounded)
Maximum Month	2.9610	26.45	52.70	82.111, (82.11 rounded)

Source: City of Freeport

The systems consist of five (5) wells with a collective pumping capacity of 5,945 GPM. Geographic distribution of these wells is shown in *Figure 2.* There is a limitation on maximum daily pumping of Freeport Well F-2. Due to its proximity to the coastal waters and concern for salt water intrusion, NWFWMD (the District) has limited pumping of this well to 0.37 MGD. However, the District has approved the future upgrade of Freeport Well F-4 to 1.7 MGD or about 1,200 GPM. The City anticipates having this on-line in 2005/2006.

An analysis of both production and sales of water for Calendar Year 2003 was performed and is presented in *Table 7*. Evident from this table is that the vast majority of water sold (80%+) was to Regional Utilities through an interlocal agreement for bulk water sales. Also significant from *Table 5* is the very small percentage of unaccounted for water, which averaged only 6.5%. Unaccounted for water is unmetered water used for line flushing, fire protection, line breaks, and leakage. At 6.5%, this is well below the normal allowable amount of 10% to 15%. Therefore, the system is considered airtight and operating efficiently.

The City's water storage capacity has been increased from a single 107,000 gallon tank to 3 tanks with a storage capability of 750,000 gallons. By 2005/2006 City anticipates adding another elevated storage tank with a half-million gallon capacity, increasing over-all storage capacity to 1,250,000 gallons. One day's storage is required. Current storage capacity exceeds that and with the half-million gallon increase, storage capacity will exceed two (2) days.

In order to determine per capita usage for purposes of projecting future needs, further analysis of water sales data for the Freeport Water System was required. *Table 8* depicts total water sales by class of user as extracted from monthly billing data for CY 2003. Using residential customers(households) from this table, the average per person use was calculated as follows:

Avg. Daily Use	=(8,513,719 gal/mo x 12 mo) / 365 days
	=279,903 GPD (Total)
Avg. GPPD	=279,903 GPD) / (1887.7 cust. (household) x 2.43 PPH)
	=61 GPPD

Maximum daily use is generally accepted to be 150% of average daily use. For purposes of the Plan the average LOS is 65 gpp per day and the peak is 100 gpp per day. 1000sq. ft commercial is considered one ERU.

Table 7
TOTAL WATER SALES ANALYSIS
(Freeport / Regional)
CY 2003

MONTH	FREEPORT TOTAL GALLONS	REGIONAL TOTAL GALLONS	TOTAL GALLONS SOLD	TOTAL GALLONS PUMPED	UNACCOUNTED FOR WATER	PERCENTAGE UNACCOUNTED FOR WATER
January	9,638,300	38,719,000	48,357,300	56,724,000	8,366,700	14.7%
February	9,668,200	25,721,000	35,389,200	38,933,000	3,543,800	9.1%
March	8,331,700	30,800,000	39,131,700	(42,000,000)	2,868,300	6.8%
April	11,384,740	45,098,000	56,482,740	59,201,000	2,718,260	4.6%
May	14,429,590	58,550,000	72,979,590	75,091,000	2,111,410	2.8%
June	11,473,670	67,598,000	79,071,670	83,216,000	4,144,330	5.0%
July	11,041,050	61,273,000	72,314,050	73,093,000	778,950	1.1%
August	9,733,690	62,685,000	72,418,690	77,956,000	5,537,310	7.1%
September	10,938,690	46,097,000	57,035,690	62,163,000	5,127,310	8.2%
October	10,633,420	44,941,000	55,574,420	60,882,000	5,307,580	8.7%
November	10,707,030	43,403,000	54,110,030	57,147,000	3,036,970	5.3%
December	9,766,110	40,631,000	50,397,110	55,230,000	4,832,890	8.8%
AVG. MO.	10,645,516	47,126,333	57,771,849	61,803,000	4,031,151	6.5%

Source: City of Freeport

Table 8
FREEPORT WATER SALES ANALYSIS
CY 2003

MONTH	COMMERCIAL		SCHOOLS		RESIDENTIAL		FREEPORT TOTAL GALLONS
	# CUST.	GALLONS	# CUST.	GALLONS	# CUST.	GALLONS	
January	142	1,823,950	3	240,140	1,782	7,574,210	9,638,300
February	141	1,863,660	3	443,820	1,772	7,360,720	9,668,200
March	143	1,632,290	3	377,680	1,789	6,321,730	8,331,700
April	146	2,286,300	3	350,410	1,790	8,748,030	11,384,740
May	147	2,472,460	3	279,070	1,794	11,678,060	14,429,590
June	147	2,340,020	3	247,290	1,791	8,886,360	11,473,670
July	150	1,745,680	3	134,490	1,809	9,160,880	11,041,050
August	150	1,342,590	3	175,590	2,000	8,215,510	9,733,690
September	150	1,549,120	3	455,090	2,011	8,934,480	10,938,690
October	152	1,796,030	3	461,110	2,033	8,376,280	10,633,420
November	152	1,435,610	3	375,780	2,038	8,895,640	10,707,030
December	151	1,456,830	3	296,550	2,043	8,012,730	9,766,110
AVG. MO.	147.6	1,812,045	3	319,752	1,887.7	8,513,719	10,645,516

Source: City of Freeport

In 1990 Walton County granted the City of Freeport "the exclusive franchise, right, and privilege to erect, construct, operate, and maintain a potable water pumping, treatment, transmission…"system for the 16.7 square miles within the Freeport corporate limits and approximately 113.3 square miles of unincorporated Walton County. Of this franchise area, Freeport currently provides potable water for 29.3 square miles in addition to the 16.7 square miles within its own corporate limits. The current service area represents the vast majority of the total population of the Freeport area.

If the current service area represents the vast majority of the total population of the franchise area, then the estimated population would be calculated at 2,043 households (residential customers) X 2.43 persons per household = 4,964 pop. in Dec. 2003. Assuming an average annual rate of population increase at 4.1 percent, the future water demand and capacity based on the current design capacity of the system and the expanded capacity of the system is reflected in Table 9. The remaining capacity is determined by taking 6.77 mgd less Regional Utilities, commercial and school use.

TABLE 9
PROJECTED WATER DEMAND (MGD)

Year	Population	Avg. LOS 65 gpp/1 million	Peak LOS 100 gpp/1 million	4.76 mgd available capacity less peak	5.85 mgd available capacity less peak. (upgrade of Well F-4 on line 05/06)
2005	5381	0.35	0.54	4.22	
2010	6489	0.42	0.65		5.20
2020	9162	0.60	0.92		4.93

Source: City of Freeport

The City is well prepared for future demands on the current and planned potable water system.

VI. NATURAL GROUNDWATER AQUIFER RECHARGE SUB-ELEMENT

Recharge to the Floridan Aquifer in Walton and Okaloosa counties is received form rainfall in the northern portions of the counties and southern Alabama where the aquifer is at or near the surface. A potentiometric high in extreme northern Walton County, Paxton, indicates that this area and adjacent areas in southern Alabama are the primary recharge areas for the counties (see Figure 6). No areas within Freeport have been designated by the Northwest Florida Water Management District as prime recharge areas for the Floridan Aquifer. It can be seen that Freeport provides virtually no recharge to the aquifer.

Water within the Floridan Aquifer moves from hydraulically up gradient areas southward into the southern portions of Walton and Okaloosa counties. Some water from the recharge area is withdrawn by wells tapping the upper level of the Floridan Aquifer in Southern Okaloosa County. The remainder is discharged into the Gulf of Mexico, Choctawhatchee River and Bay near State Highway 331 and perhaps the sand and gravel aquifer (Barr, et. al., 1985).

No prime groundwater aquifer recharge areas have been identified in Freeport, however, the southern third of the City can be seen to be a recharge area as identified in Figure 6.

7

Figure 6
Aquifer Recharge Potential